

DP-302920

**REMARKS**

Claims 1-25 are pending in the present application. Claims 2, 3, and 9 have been cancelled, Claims 1, 4-8, 10, 15, and 20 have been amended, and Claims 26-31 have been added, leaving Claims 1, 4-8, 10-31 for consideration upon entry of the present Amendment.

Antecedent basis for the amendment to Claims 1 and 10 can at least be found in the specification in paragraphs [0026] and [0034].

Claims 4-8, and 15 have been amended merely to clarify the claims. The scopes of the claims have not been narrowed by these amendments. Support for these amendments can be found at least in Figures 1-8 and in the specification in paragraphs [0007] to [0009].

Claim 20 has been amended to remove unnecessary limitations and to better clarify the claim.

New Claim 26 is original Claim 8 rewritten as an independent claim. As such, Claim 26 is allowable, since the Examiner found Claim 8 to be allowable, if rewritten as an independent claim.

Antecedent basis for new Claims 27-29 can at least be found in the specification at paragraph [0030].

Antecedent basis for new Claims 30-31 can at least be found in the specification at paragraphs [0004] and [0034] and in Figures 3-8.

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

**IDS Item**

Applicants submitted an Information Disclosure Statement on January 22, 2003. The Examiner did not initial "Search Report for EP Patent Application 02077919.5" as being considered. Applicants submit herewith a copy of the form PTO-1449, which was returned with the Office Action. Applicants respectfully request the Examiner to consider the search report.

**Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 1-6, and 9-16 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by

DP-302920

U.S. Patent No. 5,974,788 to Hepburn et al. Applicants respectfully traverse this rejection.

Applicants' independent Claim 1 is directed to a catalyst performance diagnostics system, comprising: a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material; a plurality of gas sensors disposed in fluid communication with the plurality of treatment devices; and an on-board diagnostic system coupled to the plurality of gas sensors.

Applicants' independent Claim 10 is directed to a method for monitoring catalyst performance, comprising: introducing an exhaust gas stream into an exhaust system; monitoring the exhaust gas stream using a plurality of gas sensors; passing the exhaust gas stream through a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material; measuring a response time differential between the plurality of gas sensors; and desulfating the treatment devices.

Hepburn et al. teach a method and apparatus for desulfating a  $\text{NO}_x$  trap, wherein the  $\text{SO}_x$  purge temperature is achieved by modulating the amplitude of the A/F of the mixture supplied to the engine to the engine thereby storing oxygen in the trap during lean engine cylinder events and generating the required exotherm during rich engine cylinder events. (Abstract). They further teach a heated exhaust gas oxygen (HEGO) sensor located at an inlet and outlet of the TWC converter and a third HEGO sensor located at the outlet of the  $\text{NO}_x$  trap. (Col. 2, lines 9-36; Figure 1). These HEGO sensors detect oxygen content of the exhaust gas and transmit a representative signal to an electronic engine controller EEC. (Col. 2, lines 9-36)

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

With regard to independent Claim 1, Hepburn et al. fail to teach a catalyst performance diagnostics system, comprising, *inter alia*, "a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material." Rather, Hepburn et al. teach a three-way catalytic (TWC) converter and a  $\text{NO}_x$  trap. (Col. 2, lines 9-29). Additionally, they teach the  $\text{NO}_x$  trap located downstream of TWC to store  $\text{NO}_x$  during lean A/F operation. (Col. 1, lines 13-16). As is well understood in the art, a TWC converter simultaneously reduces nitrogen oxides ( $\text{NO}_x$ ) and oxidizes carbon monoxide and hydrocarbon. Since Hepburn et al. do not teach a TWC converter having a nitrogen oxides adsorber material, Hepburn et al., at best,

DP-302920

disclose one exhaust treatment device comprising a nitrogen oxides adsorber material. Accordingly, Hepburn et al. at least fail to teach "a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material." As such, Hepburn et al. fail to teach each and every element of Applicants' independent Claim 1. Accordingly, independent Claim 1 is not anticipated. Moreover, as a dependent claim from an allowable independent claim, Claims 2-9 are, by definition, also allowable.

With regard to Applicants' independent Claim 10, Hepburn et al. fail to teach a method of monitoring catalyst performance, comprising, *inter alia*, passing an exhaust gas stream through a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material. Rather, as noted above, Hepburn et al., at best, teach one treatment device comprising a nitrogen oxides adsorber material. Since Hepburn et al. fail to teach each and every element of Applicants' independent Claim 10, Hepburn et al. do not anticipated independent Claim 10. Moreover, as a dependent claim from an allowable independent claim, Claims 11-16 are also allowable.

#### Claim Rejections Under 35 U.S.C. § 103(a)

Claim 7 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,974,788 to Hepburn et al. in view of U.S. Patent No. 5,369,956 to Daudel et al. Applicants respectfully traverse this rejection.

Daudel et al. teach an exhaust gas after treatment device for internal combustion engines having a catalyzer for the selective catalytic reduction of oxides of nitrogen from exhaust gases of motor vehicle diesel engines. (Abstract). They further teach that an ammonia sensor may be provided in the exhaust treatment device. (Abstract).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5

DP-302920

U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

In making the obviousness rejection, the Examiner merely relied upon Daudel et al. for their teaching of a sensor with an exhaust treatment device. However, Daudel et al. fail to cure the deficiencies of Hepburn et al. More particularly, Hepburn et al., either alone or in combination with Daudel et al., fail to teach or suggest a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material. Rather, Daudel et al. teach a single exhaust treatment device. Absent is any teaching that this device even comprises a nitrogen oxides adsorber material. For at least this reason, Applicants' independent Claim 1 is not obvious over Hepburn et al. in view of Daudel et al. Accordingly, as a dependent claim from an allowable independent claim, Claim 7 is also allowable.

Claims 17-19 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,974,788 to Hepburn et al. in view of U.S. Patent No. 6,171,565 to Höhne et al. Applicants respectfully traverse this rejection.

Höhne et al. teach a process of operating a nitrogen oxides storage catalyst of an exhaust gas treatment system. (Abstract). They further teach that a linear oxygen sensor is disposed downstream from the storage catalyst to determine the deterioration in the storage capacity of the catalyst. (Col. 3, lines 9-17).

Höhne et al. fail to cure the deficiencies of Hepburn et al. More particularly, Hepburn et al., either alone or in combination with Höhne et al., fail to teach or suggest a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material. Absent is any suggestion or motivation to provide additional NO<sub>x</sub> adsorbers to the exhaust treatment system of Hepburn et al. As such, even if combined, Hepburn et al. and Höhne et al. at least fail to teach passing an exhaust gas stream through a plurality of treatment devices, wherein at least two treatment devices comprise a nitrogen oxides adsorber material. Accordingly, independent Claim 10 is not obvious over Hepburn et al. in view of Höhne et al. Moreover, as a dependent claim from an allowable independent claim, Claim 17-19 are also allowable.

DP-302920

Claims 20-25 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,974,788 to Hepburn et al. in view of U.S. Patent No. 5,077,970 to Hamburg et al. Applicants respectfully traverse this rejection.

Applicants' independent Claim 20 is directed to a method for monitoring and treating emissions breakthrough in an exhaust system, comprising: introducing an exhaust gas stream into an exhaust system; passing the exhaust gas stream through a plurality of treatment devices; monitoring the exhaust gas stream using the plurality of gas sensors; adjusting an air to fuel ratio; detecting an emissions breakthrough; adjusting the air to fuel ratio; and catalytically treating the emissions breakthrough.

Hamburg et al. teach a method of on board detection of the degradation of an automotive catalyst, which receives the emissions from an engine placed in a closed-loop feedback control with an A/F characteristic sensor immersed in the emissions. (Abstract).

Hamburg et al. fail to cure the deficiencies of Hepburn et al. More particularly, Hepburn et al., either alone or in combination with Hamburg et al, fail to teach or suggest a method for monitoring and treating emissions breakthrough in an exhaust system comprising, *inter alia*, catalytically treating the emissions breakthrough. Hepburn et al. teach "breakthrough in the trap is minimized." (Col 4, lines 12-28). However, Hepburn et al. do not teach or suggest catalytically treating the emissions breakthrough. Moreover, the Examiner relied upon Hamburg et al. merely for their teaching of detecting breakthrough in the catalyst. (Office Action, page 4). Absent in Hamburg et al., however, is any teaching or suggesting of catalytically treating the emissions breakthrough. Accordingly, even if Hepburn et al. were combined with Hamburg et al., they still fail to teach or suggest each and every element of Applicants independent Claim 20. Accordingly, independent Claim 20 is not obvious over Hepburn et al. in view of Hamburg et al. Moreover, as a dependent claim from an allowable independent claim, Claims 22-25 are, by definition, also allowable.

#### Claim Objection

Claims 8 has been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

DP-302920

New Claim 26 is Claim 8 rewritten as an independent claim. Accordingly, Claim 26 is allowable.

Prior Art Made of Record

The Examiner has not relied upon the prior art made of record in making the rejections cited in the Office Action. Nonetheless, Applicants submit that Applicants' invention as defined by Applicants' claims is not anticipated by or obvious in view of the prior art made of record.


It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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